

## CLAIMS:

1. An apparatus for converting linear motion into rotary motion or vice versa comprising a shaft which is rotatable about a fixed axis and carrying a circular cam  
5 mounted eccentrically relative to that axis, the cam being rotatably mounted within a journal, an axis of rotation of the cam relative to the journal being spaced from a centre of the journal, the journal being in turn rotatably mounted within a housing mounted for reciprocating motion along a second axis in a direction transverse to the axis of the shaft whereby reciprocating motion of the housing along the second axis  
10 is converted into rotation of the shaft, or rotation of the shaft is converted into reciprocating motion of the housing along the second axis.
2. An apparatus as claimed in claim 1, wherein the fixed axis of the shaft is spaced from the second axis.
- 15 3. An apparatus as claimed in claim 1, wherein the fixed axis of the shaft is in-line with the second axis.
4. An apparatus as claimed in any one of claims 1 to 3, wherein the housing is rigidly  
20 fixed to a piston of an internal combustion engine.
5. An apparatus as claim in claim 4 when dependent on claim 2, wherein the spacing of the fixed axis of the shaft from the second axis is such that the duration of a power stroke of the piston is shortened relative to a compression stroke of the piston.
- 25 6. An apparatus as claimed in claim 5, wherein the shortening of the duration of the power stroke results in an increase in the mean velocity of the piston over the power stroke.
- 30 7. An apparatus as claimed in any one of claims 1 to 6, wherein the journal is arranged so that rotation of the journal relative to its centre oscillates between

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clockwise and anticlockwise rotation, in response to unidirectional rotation of the shaft relative to the axis of the shaft.

8. An apparatus as claimed in any one of the preceding claims wherein the journal is  
5 in the form of a disc.

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**AMENDED CLAIMS**

[received by the International Bureau on 26 October 2004 (26.10.04);  
original claims 1-8 replaced by amended claims 1-10 (2 pages)]

1. An apparatus for converting linear motion into rotary motion or vice versa comprising a shaft which is rotatable about a fixed axis and carrying a circular cam  
5 mounted eccentrically relative to that axis, the cam being rotatably mounted within a journal, an axis of rotation of the cam relative to the journal being spaced from a centre of the journal, the journal being in turn rotatably mounted within a housing mounted for reciprocating motion along a second axis in a direction transverse to the axis of the shaft whereby reciprocating motion of the housing along the second axis  
10 is converted into rotation of the shaft, or rotation of the shaft is converted into reciprocating motion of the housing along the second axis.
2. An apparatus as claimed in claim 1, wherein the fixed axis of the shaft is spaced from the second axis.  
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3. An apparatus as claimed in claim 1, wherein the fixed axis of the shaft is in-line with the second axis.
4. An apparatus as claimed in any one of claims 1 to 3, wherein the journal is arranged  
20 so that rotation of the journal relative to its centre oscillates between clockwise and anticlockwise rotation, in response to unidirectional rotation of the shaft relative to the axis of the shaft.
5. An apparatus as claimed in any one of the preceding claims wherein the journal is  
25 in the form of a disc.
6. An apparatus as claimed in any one of the preceding claims wherein in rotation of the shaft there exists a configuration in which the fixed axis, the axis of rotation of the cam relative to the journal, and the centre of the journal are aligned in a line  
30 perpendicular to the second axis.

7. A nautical steering system including an apparatus as claimed in any one of claims 1 to 6.
- 5 8. An apparatus as claimed in any one of claims 1 to 6, wherein the housing is rigidly fixed to a piston of an internal combustion engine.
9. An apparatus as claimed in claim 8 when dependent on claim 2, wherein the spacing of the fixed axis of the shaft from the second axis is such that the duration of a power stroke of the piston is shortened relative to a compression stroke of the piston.
- 10 10. An apparatus as claimed in claim 9, wherein the shortening of the duration of the power stroke results in an increase in the mean velocity of the piston over the power stroke.

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